IN THE CLAIMS:

1. (Currently Amended) A system for monitoring link delays and faults in an IP network, comprising:

a monitoring station identifier that computes a set of monitoring stations for a plurality of network trees that covers links, including at least one link that is not included in at least one of said network trees, in at least a portion of said network, wherein each of said monitoring stations monitors one network tree, at least one monitoring station also monitoring said at least one link; and wherein said set of monitoring stations is selected as a minimal set; and

a probe message identifier, coupled to said monitoring station identifier, that computes a set of probe messages to be transmitted by at least ones of said set of monitoring stations such that said delays and faults in specific links spanning said set of monitoring stations, including said at least one link, can be determined.

2. (Canceled)

3. (Original) The system as recited in Claim 1 wherein said set of probe messages is a minimal set.

4. (Original) The system as recited in Claim 1 wherein said set of monitoring stations covers links in an entirety of said network.

5. (Original) The system as recited in Claim 1 wherein said probe messages have a selected one of:

identical message costs, and

message costs that are based on a number of hops to be made by said probe messages.

6. (Previously Presented) The system of Claim 1, wherein said probe message identifier, coupled to said monitoring station identifier, employs polynomial-time approximation to compute said set of probe messages to be transmitted by at least ones of said set of monitoring stations such that said delays and faults can be determined.

7. (Canceled)

8. (Currently Amended) A method of monitoring link delays and faults in an IP network, comprising:

computing a set of monitoring stations for a plurality of network trees that covers links, including at least one link that is not included in at least one of said network trees, in at least a portion of said network, wherein each of said monitoring stations monitors one network tree, at least one monitoring station also monitoring said at least one link, wherein said set of monitoring stations is selected as a minimal set; and

computing a set of probe messages to be transmitted by at least ones of said set of

monitoring stations such that said delays and faults in specific links spanning said set of monitoring stations, including said at least one link, can be determined.

9. (Canceled)

10. (Original) The method as recited in Claim 8 wherein said set of probe messages is a minimal set.

11. (Original) The method as recited in Claim 8 wherein said set of monitoring stations covers links in an entirety of said network.

12. (Original) The method as recited in Claim 8 wherein said probe messages have a selected one of:

identical message costs, and message costs that are based on a number of hops to be made by said probe messages.

13. (Previously Presented) The method of Claim 8, wherein said computing said set of monitoring stations comprises employing polynomial-time approximation algorithms.

14. (Canceled)

15. (Currently Amended) A system for monitoring link delays and faults in an IP network, comprising:

a monitoring station identifier that employs polynomial-time approximation algorithms to compute a selected minimal set of monitoring stations for a plurality of network trees that covers links, including at least one link that is not included in at least one of said network trees, in at least a portion of said network, wherein each of said monitoring stations monitors one network tree, at least one monitoring station also monitoring said at least one link; and

a probe message identifier, coupled to said monitoring station identifier, that employs polynomial-time approximation algorithms to compute a minimal set of probe messages to be transmitted by at least ones of said set of monitoring stations such that said delays and faults, including said at least one link, can be determined.

16. (Original) The system as recited in Claim 15 wherein said set of monitoring stations covers links in an entirety of said network.

17. (Original) The system as recited in Claim 15 wherein said probe messages have a selected one of:

identical message costs, and

message costs that are based on a number of hops to be made by said probe messages.

18. (Original) The system as recited in Claim 15 wherein said minimal set of

monitoring stations guarantees delay and fault monitoring of all active links in a presence of at most *K*-1 failures.

19. (Original) The system as recited in Claim 15 wherein said minimal set of monitoring stations always covers said links in said at least said portion of said network.

20. (Currently Amended) A system for monitoring link delays and faults in an IP network, comprising:

a monitoring station identifier that computes a set of monitoring stations for a plurality of network trees that covers links, including at least one link that is not included in at least one of said network trees, in at least a portion of said network, wherein each of said monitoring stations monitors one network tree, at least one monitoring station also monitoring said at least one link, wherein said set of monitoring stations is a minimal set; and

a probe message identifier, coupled to said monitoring station identifier, that computes a set of probe messages to be transmitted by at least ones of said set of monitoring stations such that said delays and faults in specific links spanning said set of monitoring stations, including said at least one link, can be determined,

wherein said minimal set of stations satisfies at least two constraints:

a covering set constraint; and

a covering assignment constraint.

21. (Previously Presented) The system as recited in Claim 1, wherein said minimal set of monitoring stations is an optimal set of monitoring stations.

22. (Currently Amended) A method of monitoring link delays and faults in an IP network, comprising:

computing a set of monitoring stations for a plurality of network trees that covers links, including at least one link that is not included in at least one of said network trees, in at least a portion of said network, wherein each of said monitoring stations monitors one network tree, and at least one monitoring station monitors said at least one link, wherein said set of monitoring stations is a minimal set; and

computing a set of probe messages to be transmitted by at least ones of said set of monitoring stations such that said delays and faults in specific links spanning said set of monitoring stations, including said at least one link, can be determined

wherein said minimal set of stations satisfies at least two constraints:

a covering set constraint; and

a covering assignment constraint.